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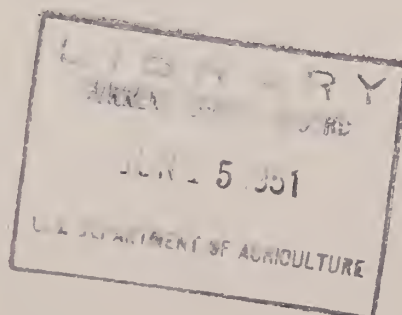


Eastern Regional Research Laboratory
Philadelphia 18, Pennsylvania

PUBLICATIONS AND PATENTS
OF THE
EASTERN REGIONAL RESEARCH LABORATORY

July - December 1950

(Reprints of Nos. 458, 460 and 504 are not available)



BUREAU OF AGRICULTURAL AND INDUSTRIAL CHEMISTRY
AGRICULTURAL RESEARCH ADMINISTRATION
UNITED STATES DEPARTMENT OF AGRICULTURE

July - December

Publications

- 457 Aceto, Nicholas, Edwards, Paul W., Eskew, Roderick K., Redfield, Clifford S., Hurley, Rita F., and Hoersch, Albert, Jr.
Production of Leaf Meals from Vegetable Wastes in Rotary Alfalfa Driers. AIC-286, December 1950. (Processed)
 A process is described for production of high-vitamin, high-protein leaf meals from vegetable wastes in a rotary, direct-fired, alfalfa-type drier. Cost estimates are given for the five wastes studied, namely, pea vines, lima bean vines, broccoli, spinach, and beet tops.
- 458 Ault, Waldo C., Wells, P. A., and Stirton, A. J.
Progress of Government Research on Animal Fats. Proceedings of the Twenty-Third Annual Convention Soap and Glycerine Industry, held in New York City, January 1950
 The work of the Oil and Fat Division at the Eastern Regional Research Laboratory is discussed, with special emphasis on the work of the Surface Active Agent Section. Past accomplishments of this group are reviewed, and a general discussion of our present research program in this field is presented.
- 459 Badgett, C. O.
Solvents for Extracting Nicotine from Aqueous Solutions. Industrial and Engineering Chemistry, vol. 42, p. 2530-2531, December 1950.
 The distribution coefficients of nicotine between water and several organic solvents at 10°, 25°, and 40° C. are reported.
- 460 Beinhart, Ernest G.
TOBACCO CHEMISTS IN UNITED STATES HOLD FOURTH ANNUAL MEETING. *Revue Internationale des Tabacs*, vol. 25, no. 214, p. 209-211, November 1950.
COMPANY EXPERTS GATHER. Tobacco (New York), vol. 131, no. 14, p. 6-7, October 5, 1950.
 A brief report of the fourth annual tobacco research conference, held at Pennsylvania State College, September 11-12, 1950. Sixteen papers were presented. The subjects included smoke analyses, nitrogen compounds, nicotine recovery, cigarette paper, and laboratory methods. Abstracts of the papers are available from Professor C. O. Jensen, State College, Pa.
- 461 Borasky, Rubin
GUIDE TO THE LITERATURE ON COLLAGEN. AIC-278, July 1950 (Processed.)
 A list of 1,008 references primarily on collagen, but included are references on gelatin, glue, leather, elastin, reticulin, connective tissue, many proteins, and other substances, all of which contribute to knowledge of the biology, biophysics, and chemistry of collagen. Citations are classified under three main headings: biology, biophysics, and chemistry. The biology and chemistry references are further classified under four and twelve subheadings, respectively. Author and subject indexes complete the publication.

- 462 Brice, B. A., Halwer, M., and Speiser, R.

PHOTOELECTRIC LIGHT-SCATTERING PHOTOMETER FOR DETERMINING HIGH MOLECULAR WEIGHTS. Journal of the Optical Society of America, vol. 40, p. 768-778, November 1950.

A photoelectric photometer for determination of high molecular weights is described. The apparatus permits measurement of absolute turbidity, dissymmetry, and depolarization of dilute solutions of polymers. By use of Debye's theory, molecular weights and particle sizes can be calculated from these data. The performance of the instrument was tested by comparing results for molecular weight, turbidity, and particle size with data obtained by other methods.

- 463 Calesnick, Eleanor J., Hills, Claude H., and Willaman, J. J.

PROPERTIES OF A COMMERCIAL FUNGAL PECTASE PREPARATION. Archives of Biochemistry, vol. 29, p. 432-440, December 1950.

Properties of fungal pectase are reported, including the effects of pH, mono- and di-valent cations, temperature, and stability.

- 464 Claffey, J. B., Eskew, Roderick K., and Beinhart, E. G.

RECOVERY OF NICOTINE FROM *NICOTIANA RUSTICA* BY STEAM DISTILLATION. AIC-284, October 1950. (Processed).

Describes experiments to extract nicotine from *Nicotiana rustica*. The principle employed was volatilization of nicotine by steam distillation after lime was added to release nicotine from the plant material. The plants contained sufficient water for distillation, but the dried material required addition of water. Distillation was carried out at atmospheric pressure, at vacuum, and at several combinations of these two conditions. The concentration of nicotine in the distillate was about 0.8 percent; about 95 percent of the nicotine was distilled from both the plants and the dried material. Sticking to the walls of the drier was eliminated by controlling the quantity of lime used.

- 465 Claffey, J. B., Strolle, E. O., Phillips, G. W. Macpherson, and Eskew, Roderick K.

SCRUBBING NICOTINE FROM STEAM. AIC-285, December 1950. (Processed).

This paper describes experiments to recover nicotine from a nicotine-steam mixture by scrubbing with sulfuric acid. The product obtained in the scrubbing operation is nicotine sulfate, which at a concentration of 40 percent is used extensively as an insecticide. Packed scrubbers give high recovery of nicotine but eventually become fouled with ammonium sulfate crystals formed from the ammonia associated with the nicotine. Two unpacked bubble scrubbers used in series did not become fouled and gave efficient scrubbing.

- 466 Cordon, T. C.

CANAIGRE INVESTIGATIONS. VII. FERMENTATION OF EXTRACT LIQUORS, AND IDENTITY OF THE BACTERIA AND PRODUCTS OF THEIR GROWTH. Journal of the American Leather Chemists Association, vol. 45, p. 485-502, August 1950.

Fermentation of canaigre extract liquors by *Aerobacter aerogenes* is described. The products formed and amounts produced under various conditions of aeration, temperature and supplemental nutrients are discussed.

467 Gordon, T. C., Treadway, R. H., Walsh, Margaret D., and Osborne, Madelyn F
LACTIC ACID FROM POTATOES. Industrial and Engineering Chemistry,
vol. 42, p. 1833-1836, September 1950.

Production of lactic acid by fermentation of potatoes is reported. Amylases produced by *Aspergillus niger* N.R.R.L. 330 were used to saccharify the starch; the sugars were fermented to lactic acid by *Lactobacilli*. *Lactobacillus pentosus*, the most efficient organism tried, produced 80 to 90 percent lactic acid (based on the original carbohydrate) in the fermented mash. The acid was recovered and purified by the methanol vapor method; 85.5 percent of the acid in the mash was recovered.

468 Dryden, E. C., Wrigley, A. N., and Willaman, J. J.
THE PREPARATION AND PROPERTIES OF ALLYL PECTIN. Official Digest,
Federation of Paint and Varnish Clubs, no. 309, p. 779-781,
October 1950.

Allyl ethers of pectin were prepared, and their properties were studied. Films of polymerized allyl pectins were prepared and tested.

469 Eskew, R. K., Phillips, G. W. M., Homiller, R. P., Eisenhardt, N. H.
SUPERIOR JUICE CONCENTRATE--YET ONLY A SINGLE PASS. Food Industries,
vol. 22, p. 2067-2069, December 1950.

Two processes for preparing full-flavor frozen grape juice concentrate are described. These processes include recovery of essence by the methods developed at the Eastern Regional Research Laboratory and are applicable to both sweetened and unsweetened concentrate.

470 Fisher, C. H., and Filachione, E. M.
PROPERTIES AND REACTIONS OF LACTIC ACID--A REVIEW. AIC-279, October 1950 (Processed.)

La Lactic acid is reviewed under the following headings: History, manufacture, physical properties and structure, thermal decomposition, reactions involving the hydroxyl group, reactions involving the carboxyl group, reactions of both the hydroxyl and carboxyl groups, and toluenesulfonates as intermediates in the preparation of lactic acid derivatives. The paper includes 187 literature references.

471 Gordon, W. G., Semmett, W. F., and Bender, M.
ALANINE, GLYCINE AND PROLINE CONTENTS OF CASEIN AND ITS COMPONENTS.
Journal of the American Chemical Society, vol. 72, p. 4282,
September 1950.

Casein, α -casein, β -casein and γ -casein were analyzed for alanine, glycine and proline by the radioisotope derivative technique. Hydroxyproline was shown to be absent from casein by the same method.

472 Haines, Paul G., and Eisner, Abner
ACETYLATION OF 3,2'-NICOTYRINE. Journal of the American Chemical Society, vol. 72, p. 4618-4621, October 1950.

Acetylation of 3,2'-nicotyrine has been shown to produce a mixture of 1-methyl-2-(3-pyridyl)-5-acetylpyrrole and 1-methyl-2-(3-pyridyl)-4-acetylpyrrole which can be separated by fractional distillation. Structures were assigned to the two products by comparison of their ultraviolet absorption spectra with those of 2-phenyl-4-methyl-5-acetylpyrrole, 2-phenyl-3,5-dimethyl-4-acetylpyrrole, and 2-phenyl-3-acetyl-5-methylpyrrole. The syntheses of these new pyrrole derivatives are described.

- 473 Hipp, N. J., Groves, M. L., Custer, J. H., and McMeekin, T. L.
SEPARATION OF γ -CASEIN. Journal of the American Chemical Society, vol. 72, p. 4928-4931, November 1950.
 Describes a method for separating γ -casein from α - and β -casein that consists in alcohol-water fractionation and isoelectric precipitation. In composition and properties, γ -casein is similar to the alcohol-soluble casein described by Osborne and Wakeman (J. Biol. Chem. 33, 243 (1918)).
- 474 Hoover, Sam R., and Kokes, Elsie L.
MILK PROTEINS AND LACTOSE FROM DRIED SKIM MILK. Industrial and Engineering Chemistry, vol. 42, p. 1910-1912, September 1950.
 The protein and lactose of dried skim milk were separated and recovered by countercurrent extraction with five times its weight of 0.25 percent sodium chloride at pH 4.1. Essential conditions for the extraction are described, and the properties of the recovered protein are discussed.
- 475 Hoover, Sam R., and Porges, Nandor
TREATMENT OF DAIRY WASTE BY AERATION. II. CONTINUOUS AERATION STUDIES. Proceedings of the Fifth Industrial Waste Conference, held at Purdue University, November 29-30, 1949. Purdue Engineering Bulletin, Extension Series No. 72, p. 137-144, 1950.
 A simulated milk waste (0.1 percent solution of dry skim milk) was oxidized aerobically by a natural microflora under controlled conditions of temperature, aeration, and flow. The microorganisms oxidized 50 percent of the organic matter and assimilated 45 to 48 percent. Possible applications of these results in sanitary engineering are discussed.
- 476 Hunter, A. S., and Talley, E. A.
ACID HYDROLYSIS OF POTATOES UNDER PRESSURE. American Potato Journal, vol. 27, p. 425-438, December 1950.
 Acid hydrolysis of potatoes under pressure at various temperatures was studied; hydrochloric, sulfuric, and phosphoric acids, and sulfur dioxide were used. High temperatures caused considerable decomposition of the sugars. The ratio of the rate of hydrolysis to the rate of decomposition was greatest when hydrochloric acid was used.
- 477 Knight, H. B., Koos, R. E., Jordan, E. F., Jr., and Swern, Daniel
COMPATIBILITY OF DERIVATIVES OF 9,10-DIHYDROXYSTEARIC ACID AND 9,10-DIHYDROXYOCTADECANOL WITH SOME COMMERCIAL POLYMERS. Journal of the American Oil Chemists' Society, vol. 27, p. 281-284, July 1950.
 A study of compatibility with some commercial polymers is reported for some alkyl and alkenyl esters of low-melting 9,10-dihydroxystearic acid, 9,10-(10,9)-alkoxyhydroxyoctadecanols, esters of 9,10-(10,9)-alkoxyhydroxystearic acids, and two series of previously unreported compounds, namely, esters of the isomeric 9,10-dihydroxystearic acids with ether-alcohols and polymeric plasticizers prepared by the reaction of selected members of this group of new esters with phthalic anhydride. The most promising materials are methyl 9,10-(10,9)-methoxyhydroxystearate, esters of 9,10-dihydroxystearic acid with ethylene glycol monobutyl ether and ethylene glycol monobenzyl ether, and the polymeric plasticizers. The last-named group is compatible with polymers which differ widely in chemical structure.

478 Kocholaty, R.

MICROBIOLOGICAL OXIDATION OF ETHANOL IN VOLATILE FRUIT CONCENTRATES.

Food Research, vol. 15, p. 347-354, September-October 1950.
Apple essence of 20- to 40-fold concentration was treated with resting cells of *Acetobacter aceticum* for elimination of ethyl alcohol. The differential refractometer was used for determining alcohol with a precision of 0.01 percent.

479 Mayer, E. L., and McGovern, E. R. (Bureau of Entomology and Plant Quarantine) and Florence B. Talley and J. J. Willaman (ERRL).

TESTS FOR SYNERGISM BETWEEN NICOTINE AND PHTHALONITRILE AND BETWEEN NICOTINE AND 2,3,4,5,6-PENTACHLOROANISOLE. Journal of Economic Entomology, vol. 43, p. 533-537, August 1950.

Under the test conditions used, mixtures of nicotine and phthalonitrile were definitely synergistic against the pea aphid, armyworm, California oakworm, and diamondback moth. They showed doubtful or no synergism against the green dock beetle, celery leaf tier, and pomace fly. They showed antagonism against greenhouse thrips. Mixtures of nicotine and pentachloroanisole showed neither synergism nor antagonism against the diamondback moth and the armyworm. In addition to the Finney method for calculating synergism data, a short-cut procedure is presented. Each was applied to four sets of the data. The numerical values obtained confirm the conclusions of synergism and antagonism.

480 McMeekin, T. L., Groves, M. L., and Hipp, N. J.

COMPOSITION AND DENSITIES OF β -LACTOGLOBULIN CRYSTALS IN SUCROSE AND SERUM ALBUMIN SOLUTIONS. Journal of the American Chemical Society, vol. 72, p. 3662-3666, August 1950.

The composition and densities of β -lactoglobulin crystals were determined after the crystals were equilibrated in serum albumin and sucrose solutions. The densities of β -lactoglobulin crystals are similar to the densities of viruses as determined by sedimentation rates in these solutions. This similarity in behavior is evidence that the degree of hydration of a protein in solution is essentially the same as that in the crystal. It was also found that sucrose penetrates the β -lactoglobulin crystal and that the loss of water by the crystal is directly proportional to the osmotic pressure calculated from the difference in sucrose concentration in the crystal and in the suspending solution.

481 Naghski, J., Krewson, C. F., Porter, W. L., and Couch, J. F.

FACTORS AFFECTING THE RUTIN CONTENTS OF DRIED BUCKWHEAT MEALS.

Journal of the American Pharmaceutical Association, vol. 39 p. 696-698, December 1950.

About 80 to 90 percent of the rutin of the buckwheat plant is localized in the leaves and blossoms, which constitute from 45 to 70 percent of the dry weight of the plant. Fractional drying and screening produce a leaf meal of high rutin content. Wilting in the sun, if controlled carefully, is a valuable adjunct to artificial drying of buckwheat for production of dried meals.

- 482 Nichols, Peter L., Jr.
USEFUL RELATIONS FOR COUNTERCURRENT DISTRIBUTION COMPUTATIONS. Analytical Chemistry, vol. 22, p. 915-918, July 1950.
Expressions are given for the prediction and evaluation of results from countercurrent distribution experiments. Included is a method for determining the number of transfers required for a given "degree of separation" and pair of partition coefficients. Also, an approximate relation is proposed for determining the number of transfers required to resolve composite peaks.
- 483 Nichols, Peter L., Jr., Riemenschneider, R. W., and Herb, S. F.
KINETICS OF ALKALI ISOMERIZATION OF LINOLEIC, LINOLENIC, AND ARACHIDONIC ACIDS. Journal of the American Oil Chemists' Society, vol. 27, p. 329-336, September 1950.
A theory of alkali isomerization of linoleic, linolenic, and arachidonic acids is presented in which systematic classification of concurrent prototropic changes is introduced. The limited experimental data available are correlated.
- 484 Polis, B. D., and Shmukler, H. W.
ALDOLASE IN BOVINE MILK. Journal of Dairy Science, vol. 33, p. 619-622, September 1950.
Application of the procedure of Sibley and Lehninger (J. Biol. Chem. 177, 859 (1949) for the assay of aldolase showed the presence of this enzyme in normal cow's milk in the same concentration range as in blood serum. The presence of the enzyme in various milk fractions is indicated, and its sensitivity to heat discussed.
- 485 Polis, B. David, Shmukler, H. W., and Custer, J. H.
ISOLATION OF A CRYSTALLINE ALBUMIN FROM MILK. Journal of Biological Chemistry, vol. 187, p. 349-354, November 1950.
The albumin present in trace amounts in milk whey was concentrated by salt and alcohol fractionation. Purified bovine milk and serum albumin were crystallized with alkaline ammonium sulfate in the presence of phosphate and caprylate ions. Comparison of the physical, chemical and serological properties of crystalline bovine milk and serum albumin indicated the identity of these proteins.
- 486 Polis, B. David, Shmukler, H. W., Custer, J. H., and McMeekin, T. L.
ISOLATION OF AN ELECTROPHORETICALLY HOMOGENEOUS CRYSTALLINE COMPONENT OF β -LACTOGLOBULIN. Journal of the American Chemical Society, vol. 72, p. 4965-4968, November 1950.
One of the components of the heterogeneous crystalline β -lactoglobulin complex was isolated in an electrophoretically homogeneous crystalline form. Some of its physico-chemical properties are described.
- 487 Porges, Nandor, and Hoover, Sam R.
TREATMENT OF DAIRY WASTE BY AERATION. I. METHODS OF STUDY. Proceedings of the Fifth Industrial Waste Conference, held at Purdue University, November 29-30, 1949. Purdue Engineering Bulletin Extension Series No. 72, p. 130-136, 1950.
Chemical procedures are presented by which changes in an aerated dairy waste may be followed and thus the oxygen demands of the protein, lactose, and total waste may be determined. Examples are given of the application of the methods to simulated dairy waste.

- 488 Porges, Nandor; Pepinsky, Janet B., Hendler, Nancy C., and Hoover, Sam R.
BIOCHEMICAL OXIDATION OF DAIRY WASTES. II. COMPARATIVE STUDY OF YEASTS Sewage and Industrial Wastes, vol. 22, No. 7, p. 888-892, July 1950.

Of four yeasts tried in laboratory experiments, only *Saccharomyces fragilis* significantly reduced the pollution load of dilute dairy waste. This organism converted the soluble lactose and casein to insoluble yeast cells that were readily removed by centrifuge. The clear effluent showed 84 to 93 percent reduction in chemical oxygen demand in 48 to 72 hours. Supplementing the waste with ammonium sulfate enhanced activity.

- 489 Ratchford, William P.
LACTIC ACID DERIVATIVES. 4,4,6-TRIMETHYL-2-(1-HYDROXYETHYL)-5,6-DI-HYDRO-1,3,4H-OXAZINE. Journal of the American Chemical Society, vol. 72, p. 3297-3298, July 1950.

Reaction of methyl lactate with 4-methyl-4-amino-2-pentanol gave 4,4,6-trimethyl-2-(1-hydroxyethyl)-5,6-dihydro-1,3,4H-oxazine instead of the expected lactamide.

- 490 Ratchford, William P.
N-HYDROXYALKYL AMIDES OF LACTIC ACID. PREPARATION AND PROPERTIES Industrial and Engineering Chemistry, vol. 42, p. 1565-1567, August 1950.

Seven N-hydroxyalkyl lactamides were readily prepared in high yield by the aminolysis of methyl lactate with amino alcohols. The lactamides are hygroscopic substances of low volatility; the equilibrium hygroscopicities of five are reported. Because of their properties, these substances may be useful as humectants, plasticizers, water-soluble softeners, and chemical intermediates.

- 491 Rehberg, C. E., and Dixon, Marion B.
MIXED ESTERS OF LACTIC AND CARBONIC ACIDS. n-ALKYL CARBONATES OF n-ALKYL LACTATES. Journal of Organic Chemistry, vol. 15, p. 973-978, September 1950.

Two homologous series of n-alkyl carbonates of n-alkyl lactates having the formula $\text{ROCOOCH}(\text{CH}_2)\text{COOR}'$ were prepared, and several physical properties were determined. In one series, R is ethyl and R' is n-alkyl, in the other, R and R' are identical n-alkyl groups. Equations were developed which relate vapor pressures, boiling points, refractive indices, densities, and viscosities to the number of carbon atoms in the members of each series.

- 492 Rehberg, C. E., and Dixon, Marion B.
MIXED ESTERS OF LACTIC AND CARBONIC ACIDS. n-ALKYL CARBONATES OF VARIOUS LACTATES. Journal of Organic Chemistry, vol. 15, p. 1246-1252, November 1950.

Nineteen alkyl carbonates of lactic esters, comprising three homologous series, were prepared. In each series, the vapor pressures, boiling points, refractive indices, densities, and viscosities were correlated with the number of carbon atoms in the compounds.

DIESTERS OF LACTIC ACID. ADIPATES OF VARIOUS LACTATES. Journal of the American Chemical Society, vol. 72, p. 5757-5759, December 1950. The adipates of sixteen lactic esters were prepared from adipyl chloride and the lactates. Boiling points of the adipates were determined at various pressures, plotted on Cox charts, and correlated with boiling points of the alcohols used in making the lactates. Refractive indices, densities, and viscosities were determined at 20° and 40°.

DIGLYCOL BIS(CARBONATES) OF LACTIC ESTERS. Industrial and Engineering Chemistry, vol. 42, p. 1409-1411, July 1950.

Plasticizers made by acylating twenty-three lactic esters with diethylene glycol bis-chloroformate $[\text{O}(\text{CH}_2\text{CH}_2\text{OCOC}\text{Cl})_2]$ are described. As a class, these plasticizers were high boiling and compatible with a vinyl chloride-vinyl acetate copolymer, ethyl cellulose and cellulose acetate. The esters prepared from the n-butyl, n-hexyl, 2-ethylhexyl, 2-butoxyethyl, and 2-(2-butoxyethoxy)ethyl esters of lactic acid were relatively fluid and more efficient than many of the commercial plasticizers in plasticizing the vinyl chloride-vinyl acetate copolymer.

PLASTICIZERS FROM LACTIC ACID. n-ALKYL CARBONATES OF VARIOUS ESTERS OF LACTIC ACID. Industrial and Engineering Chemistry, vol. 42, p. 2374-2375, November 1950.

Thirty-five plasticizers made by acylating esters of lactic acid with n-alkyl chloroformates are described. Boiling points of the plasticizers and compatibilities with cellulose acetate and polyvinyl chloride (95 percent vinyl chloride copolymer) were determined. Also reported are the tensile strength, modulus at 100 percent elongation, ultimate elongation, and brittle point of each plasticized vinyl composition. As indicated by modulus and brittle point, many of the esters are more efficient than di-2-ethylhexyl phthalate as plasticizers for the vinyl resin.

ACRYLIC ESTERS OF SOME SUBSTITUTED ALKANOLS. Journal of the American Chemical Society, vol. 72, p. 5199-5200, November 1950.

Several bromo-, chloro-, nitro-, cyano- and aralkyl acrylates and two trichloroalkyl methacrylates were prepared. Trichloroethanol, although a primary alcohol, did not alcoholize ethyl acrylate. Brittle points of alkyl polyacrylates were raised slightly by halogen substituents, moderately by the phenyl group, and considerably by the nitro group.

PREPARATION AND POLYMERIZATION OF CYCLOALKYL ACRYLATES. Journal of the American Chemical Society, vol. 72, p. 4307, September 1950. Cyclohexyl and several substituted cyclohexyl alcohols were converted to the acrylic esters by the alcoholysis of ethyl acrylate. Alcohols having large substituents in the 2-position were unreactive. The esters were polymerized, and brittle points of the polymers were determined. The polymers of the acrylate and the methacrylate of the 3,3,5-trimethylcyclohexanol had brittle points of 50° and 140°, respectively. These points are about 50° higher than those of the corresponding methyl esters.

- 498 Roe, Edward P., and Swern, Daniel
DETERMINATION OF LONG-CHAIN HYDROXAMIC ACIDS. Analytical Chemistry, vol. 22, p. 1160-1162, September 1950.
A procedure is described for determining long-chain hydroxamic acids. It consists in hydrolysis to carboxylic acid and hydroxylamine hydrochloride with a known excess of aqueous, alcoholic hydrochloric acid, followed by titration of either the excess hydrochloric acid or the hydroxylamine hydrochloride formed. The former technique gives slightly low results; the latter, slightly high results. Hydroxylamine hydrochloride cannot be titrated, however, in the presence of fatty acids containing ten or fewer carbon atoms.
- 499 Rogers, J. S. (ERRL), Calderwood, H. N. (Engineering and Industrial Experiment Station, Gainesville, Florida), and Beebe, C. S. (ERRL)
STUDY OF THE TANNIN CONTENTS OF BARKS FROM THE FLORIDA SCRUB OAKS. *Quercus laevis* and *Q. cinerea*. Journal of the American Leather Chemists' Association, vol. 45, p. 733-751, November 1950.
A study of barks from the Florida scrub oak *Quercus laevis* and *Q. cinerea*, with special reference to their tannin contents and the purities of their extractives.
- 500 Shreve, O. D., and Heether, M. R., (Philadelphia Laboratory of E. I. Dupont de Nemours and Company), Knight, H. B., and Swern, Daniel (ERRL). **DETERMINATION OF TRANS-OCTADECENOIC ACIDS, ESTERS AND ALCOHOLS IN MIXTURES.** Analytical Chemistry, vol. 22, p. 1261-1263, October 1950.
An infrared spectrophotometric method, based on differences in absorption at 10.36 microns, is described for determination of trans octadecenoic acids, esters (including glycerides), and alcohols in the presence of the corresponding cis and saturated compounds. Extinction coefficients at 10.36 microns are reported for seventeen pure cis and trans monounsaturated and saturated acids, esters, and alcohols.
- 501 Shreve, O. D., and Heether, M. R., (Philadelphia Laboratory of E. I. Dupont de Nemours and Company), Knight, H. B., and Swern, Daniel (ERRL). **INFRARED ABSORPTION SPECTRA. SOME LONG-CHAIN FATTY ACIDS, ESTERS AND ALCOHOLS.** Analytical Chemistry, vol. 22, p. 1498-1501, December 1950.
Infrared absorption spectra from 2 to 15 microns have been presented for a number of pure, long-chain, saturated and monounsaturated fatty acids, methyl esters, tri-glycerides, and alcohols. Correlations of absorption bands with molecular structure have been given for all spectra. The spectra should be useful in the application of the infrared method to studies involving fats and other long-chain systems.
- 502 Stirton, Margaret H., and Hills, Claude H.
FLAVOR OF SUMMER, FALL AND WINTER VARIETIES OF APPLES BAKED IN PIES. Food Technology, vol. 4, no. 8, p. 327-329, August 1950.
A study of fifteen varieties of apples over a period of two seasons showed that for pies the flavor of summer apples was slightly superior to that of winter or fall varieties. Addition of calcium chloride to improve the texture of the softer varieties did not affect the flavor.

- 503 Swern, Daniel, and Findley, Thomas W.
CHEMISTRY OF EPOXY COMPOUNDS. XII. COOXIDATION OF ALDEHYDES AND OLEIC ACID, METHYL OLEATE OR OLEYL ALCOHOL. Journal of the American Chemical Society, vol. 72, p. 4315-4316, September 1950.
 Cooxidation of benzaldehyde, acetaldehyde or butyraldehyde and oleic acid, methyl oleate or oleyl alcohol with air in the presence of ultraviolet light was studied. Yields of 9,10-epoxy compounds of 15-40 percent were obtained.
- 504 Swern, Daniel, and Jordan, E. F., Jr.
VINYL LAURATE AND OTHER VINYL ESTERS. Organic Syntheses, vol. 39, p. 106-109. 1950.
 Laboratory procedures for the preparation of vinyl laurate, caproate, caprylate, pelargonate, caprate, myristate, palmitate, stearate, 10-hendecenoate (undecylenate), and oleate are described.
- 505 Treadway, R. H., Willits, C. O., Heisler, E. G., Ross, L.R. and Osborne, Madelyn F.
COMPOSITION OF FLOUR FROM THE 1948 POTATO CROP. AIC-277, July 1950. (Processed.)
 Analytical data are reported for 100 samples of flour produced from potatoes of the intermediate and late 1948 crop. The average potato flour contained 8.1 percent moisture and the following constituents (percent, moisture-free basis): total assimilable carbohydrate, 78; total ash, 4.4; hydrochloric acid-insoluble ash, 0.07, protein, 10.21; crude fiber, 1.8; and crude fat, 0.3.
- 506 Weil, Leopold, and Maher, Jeanne
PHOTODYNAMIC ACTION OF METHYLENE BLUE ON NICOTINE AND ITS DERIVATIVES. Archives of Biochemistry, vol. 29, p. 241-259, December 1950.
 The photodynamic action of methylene blue on nicotine and its derivatives was studied in the presence and in the absence of oxygen. Optimal conditions for the photo-oxidation and its reaction mechanism were investigated.
- 507 White, Jonathan W., Jr.
NEW CRYSTALLIZED FRUIT SPREAD SHOWS COMMERCIAL PROMISE. Food Industries, vol. 22, no. 7, p. 84, July 1950.
 A new fruit product is described as a spread made by concentration of fruit and honey mixtures, followed by fine-grained crystallization of part of the dextrose content. Details of its preparation and properties are given.
- 508 Whittenberger, R. T. (ERRL), and Marshall, R. E. (Michigan Agricultural Experiment Station).
MEASURING THE FIRMNESS OF RED TART CHERRIES. Food Technology, vol. 4, no. 8, p. 311-312, August 1950.
 Each of twenty cherries from a sample is compressed between two flat surfaces for 10 seconds by a force of approximately 300 grams. The average percent compression of the cherries is calculated. The test is useful for measuring changes in firmness caused by bruising, cooling, soaking, and other treatments.

509 Whittenberger, R. T., and Nutting, G. C.

OBSERVATIONS ON SLOUGHING OF POTATOES Food Research, vol. 15, p. 331-339, July-August 1950.

A general although imperfect relationship between the extent of sloughing of boiled potatoes and the specific gravity of the raw tissues was observed. Usually tissues of highest specific gravity sloughed the most; those of low specific gravity did not slough. Considerable variation in degree of sloughing occurred in tissues of the same specific gravity. During cold storage, both the starch content and degree of sloughing decreased, although the specific gravity of the tissues did not change. Thus sloughing appeared to be more closely correlated with the starch content of tissues than with their specific gravity. Sloughing was decreased and controlled by means of calcium salts; the effectiveness of the salts is thought to be due to their capacity both to diminish the swelling of starch granules and to strengthen the intercellular pectic bonding material.

510 Witnauer, Lee P., and Swern, Daniel.

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